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SURGICAL APPLICATIONS OF FIBRIN FILM IN THE USSR

Professors B. Yegorov, N. Priorov, A. Bagdasarov
Corresponding Members
Acad Med Sci USSR

Restoration of injured parts of dura mater presented many difficulties up to now. Various autoplastic and alloplastic materials which had been used could not be grafted successfully. Use of tissue of the dura mater itself for this purpose is also not without drawbacks.

Work done during recent years established that the dura mater cannot be regarded as merely an inert sheath with the sole function of protecting the brain; it also plays an important role in the blood circulation and liquor circulation of the brain and spinal cord, as well as in liquor resorption. For that reason, preservation of every centimeter of healthy dura mater is of great importance in surgery. Modern brain surgery has a number of ways of preserving intact this physiologically important tissue.

After the introduction in 1932 of Hemostol for use as a surgical hemostatic, Prof A. N. Filatov of the Leningrad Institute of Blood Transfusion applied fibrin film and fibrin thread made from human blood. He also developed a method for the production of fibrin film. Another method of producing fibrin film (from the plasma of donor blood) was proposed by the Central Institute of Hematology and Blood Transfusion. Fibrin film proved to be very well suited for the restoration of injured parts of dura mater and for the treatment of burns.

The Institute of Neurosurgery imeni N. N. Burdenko, Academy of Medical Sciences USSR, obtained very good results using fibrin film. An implanted fibrin film becomes covered with connective tissue elements of the epitheloid cell type within a comparatively short time. After 2 - 3 months, the film breaks up and gradually disappears. The newly formed surface of connective tissue, which faces the brain, becomes covered with a layer of cells which do not grow onto the underlying part of the pia mater encephali or the brain. The space between the newly

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formed tissue at the defect of the dura mater and the tissue of the brain remains free, so that the normal circulation of spinal liquor is not impeded.

Fibrin films that are produced by the method of the Central Institute of Hematology and Blood Transfusion and of the Moscow Institute of Sera and Vaccines imeni I. Mechnikov have found extensive application in practical neurosurgery. They can be used successfully for repairing defects of the dura mater that arise after removal of tumors and as a result of partition of the edges of the brain covering due to protrusion (swelling) of the brain tissue.

The fibrin film is usually placed directly on the brain below the dura mater, so that its edges fit under the edges of the incision in the dura mater. Whenever an operation is carried out on the brain, the cerebellum, or the spinal cord, the brain or spinal cord tissue is covered with fibrin film. In cases where another surgical operation was carried out subsequently, inspection of the implanted film showed that it had sealed the subdural space off well and had brought it back to a normal state. In the process of healing, the fibrin film was replaced by a smooth and tender connective tissue membrane.

Observations of this type, which were carried out at the Institute of Neurosurgery imeni N. N. Burdenko both in cases where the brain was unaffected and in cases where it was injured, permit the conclusion that the use of fibrin film is to be recommended under all conditions encountered in neurosurgery. Fibrin film can be preserved for a long time, is easy to sterilize, and can be transported without difficulty.

Good results with fibrin film have also been achieved in the treatment of burns. Fibrin film protects the burned surface, thus eliminating pain, and at the same time prevents plasma losses. It also expedites healing of the burned surface. The therapy of burns with fibrin film made from animal blood was proposed by Prof A. N. Filatov, who also developed a new, original method for the production of this type of film.

During the past 2 years, the Central Institute of Traumatology and Orthopedics, Ministry of Public Health USSR, has successfully used heterogenous and homogenous fibrin films for the treatment of second- and third-degree burns, for small, slowly healing wounds, and for the isolation of nerve trunks after an operation has been carried out on them. The results were beneficial with the use of both heterogenous films prepared from cattle blood plasma and/homogenous films prepared from human blood plasma. The use of fibrin film also proved advantageous in connection with operations that involved transplantation of unattached skin.

Observations made at the Surgical Clinic of the Central Institute of Hematology and Blood Transfusion proved the advisability of using fibrin film for the treatment of burns (particularly second-degree burns) and of fresh skin injuries. Furthermore, good results were obtained by using this film in cases of intestinal fistulas (particularly fistulas of the pancreas), when it is necessary to protect the skin against the action of the pancreatic juice. Fibrin film can also be used in operations within the abdominal cavity (for intestinal obstructions, fusions, etc.) in order to cover surfaces devoid of serous membranes or to isolate one tissue from another.

At present, fibrin film is being produced at the Moscow Institute of Sera and Vaccines imeni I. Mechnikov and at the Leningrad Meat Combine imeni S. M. Kirov. The use of fibrin films on a wide scale has been recommended by the Scientific Medical Council of the Ministry of Public Health USSR. The fibrin films are convenient for application and are sterile. They may be preserved for many years in sealed ampules or some other hermetically sealed vessels. It may by expected that fibrin films will find the widest application in practical medicine.

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